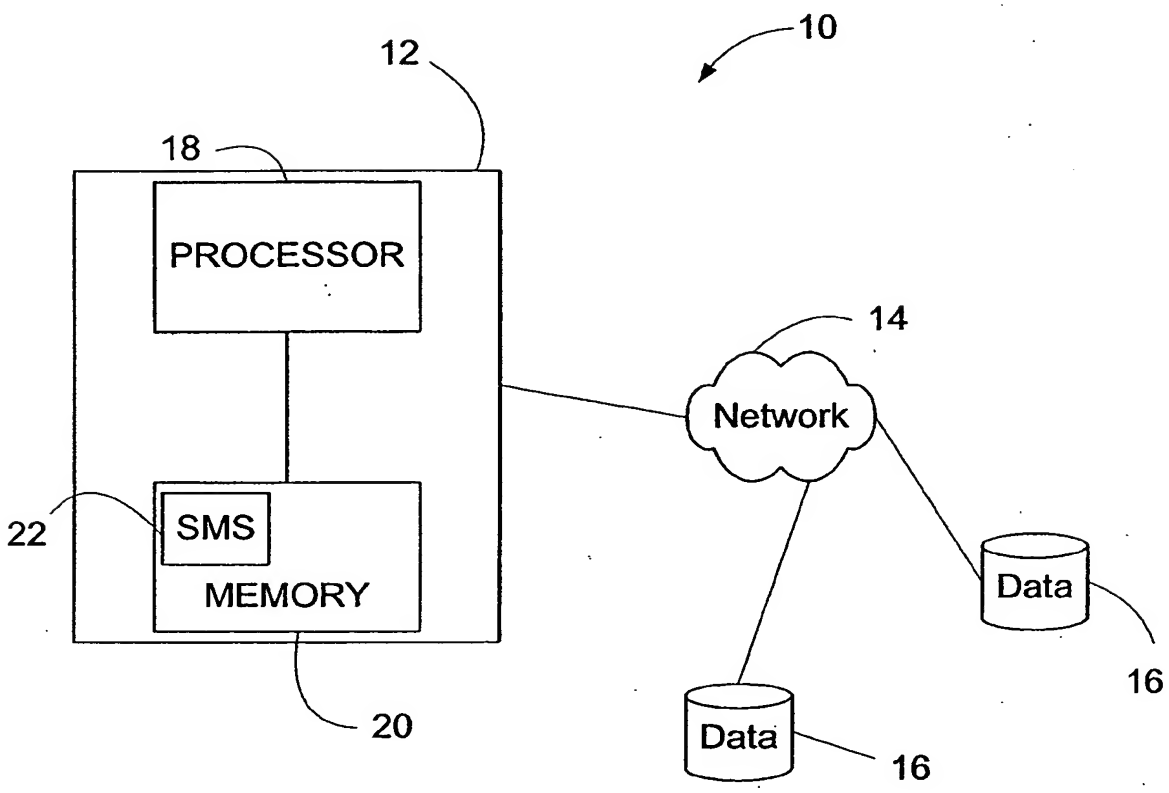

FIG. 1

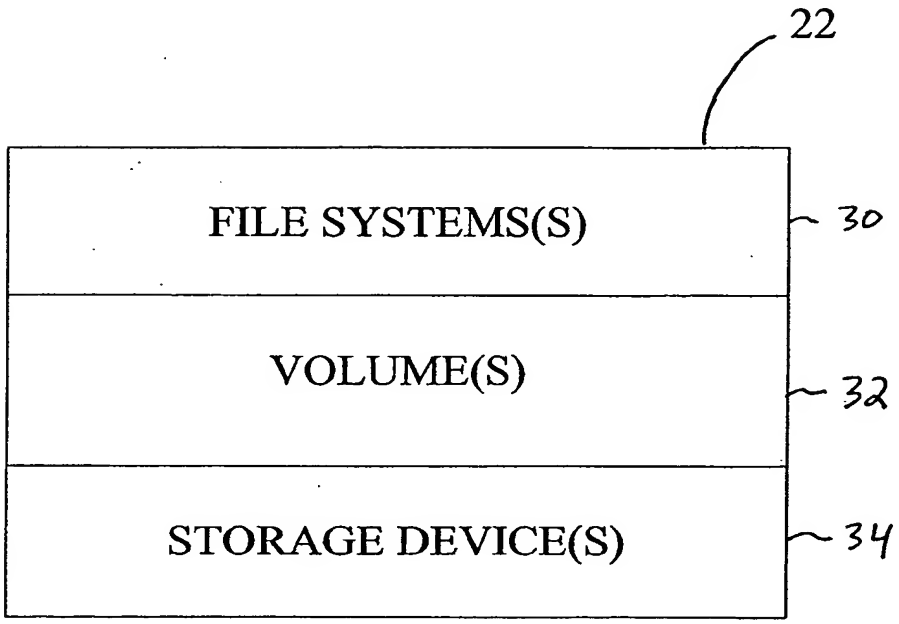

FIG. 2

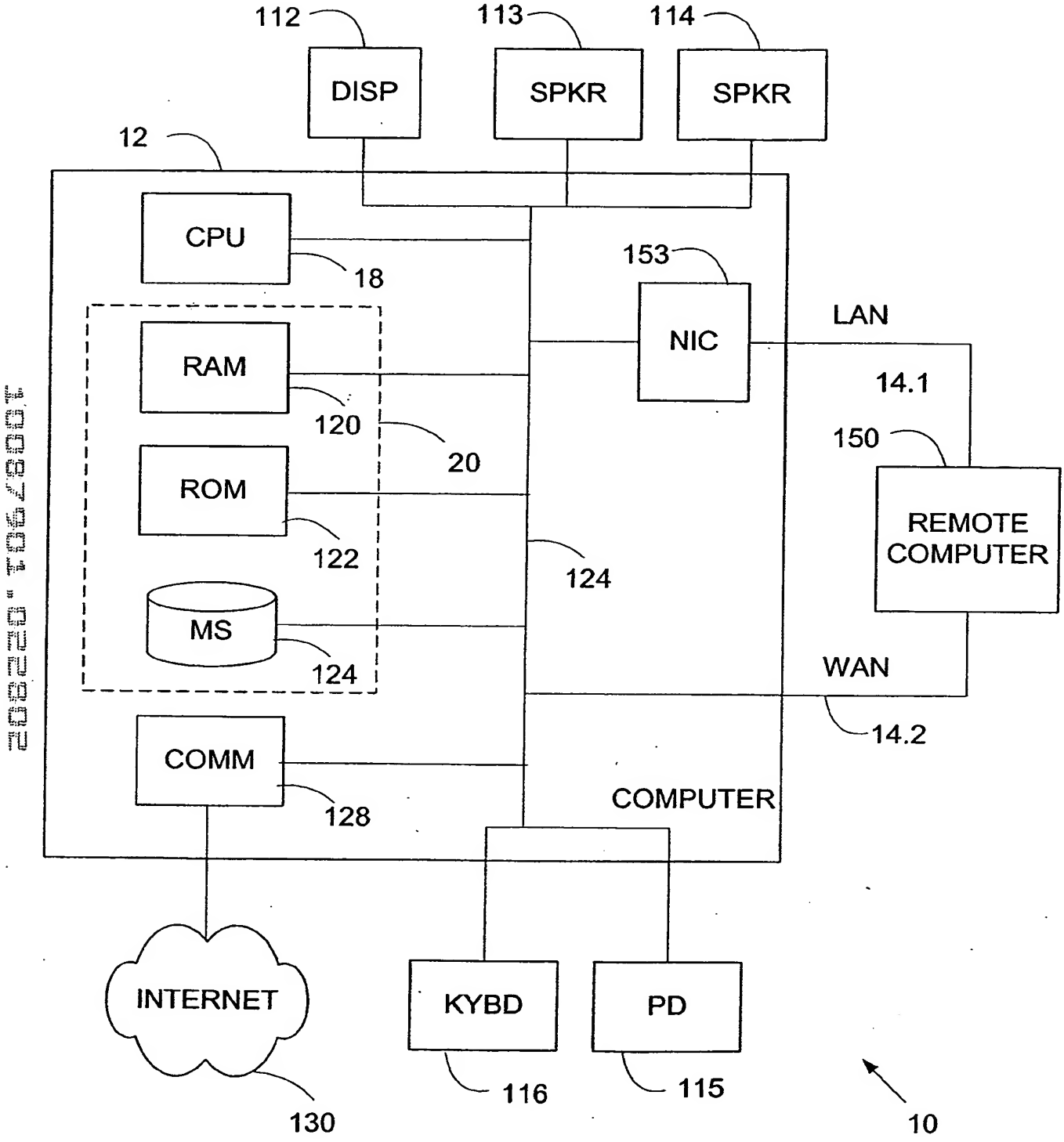
112
DISP
113
SPKR
114
SPKR
12
CPU
18
153
NIC
LAN
14.1
RAM
120
20
150
ROM
122
124
REMOTE
COMPUTER
MS
124
WAN
14.2
COMM
128
COMPUTER
INTERNET
KYBD
PD
116
115
130
10

Fig. 3

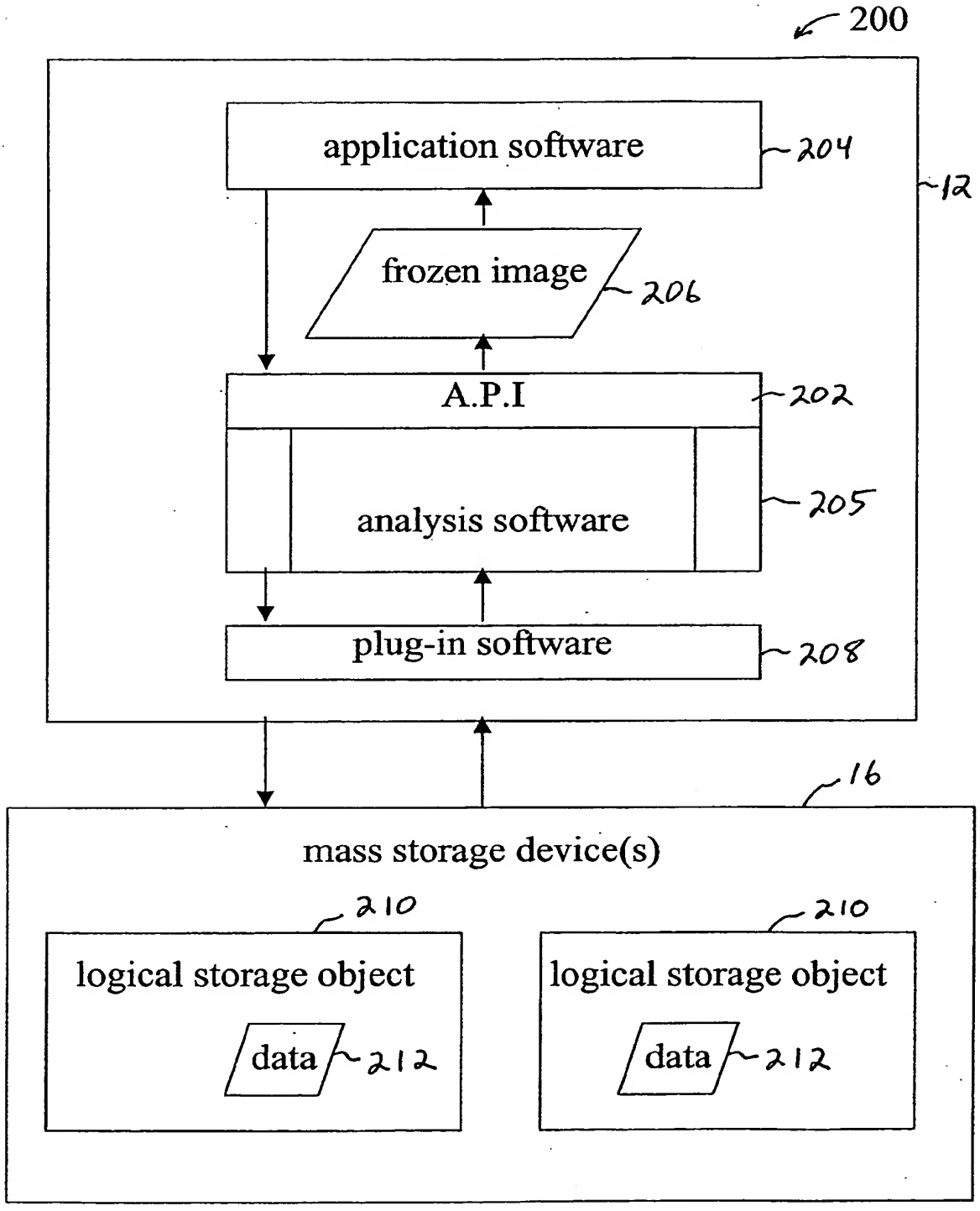
200
application software
204
12
frozen image
206
A.P.I
202
analysis software
205
plug-in software
208
16
mass storage device(s)
210
logical storage object
data
212
210
logical storage object
data
212

FIG. 4

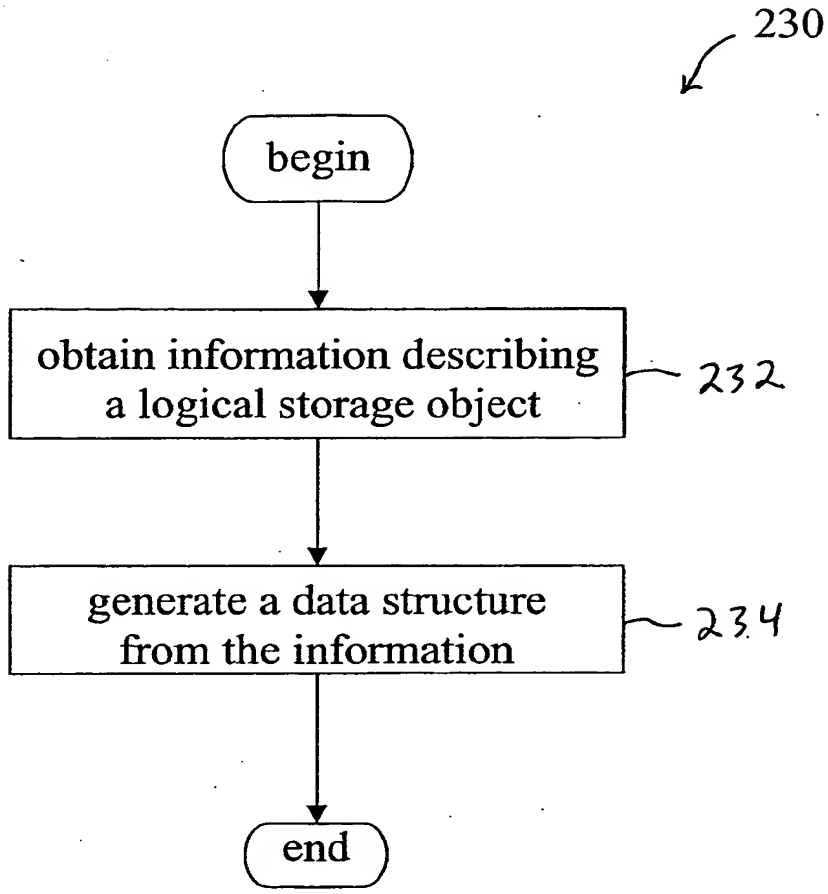
230
begin
obtain information describing a logical storage object
232
generate a data structure from the information
234
end

FIG. 5

20060229.1067.9007

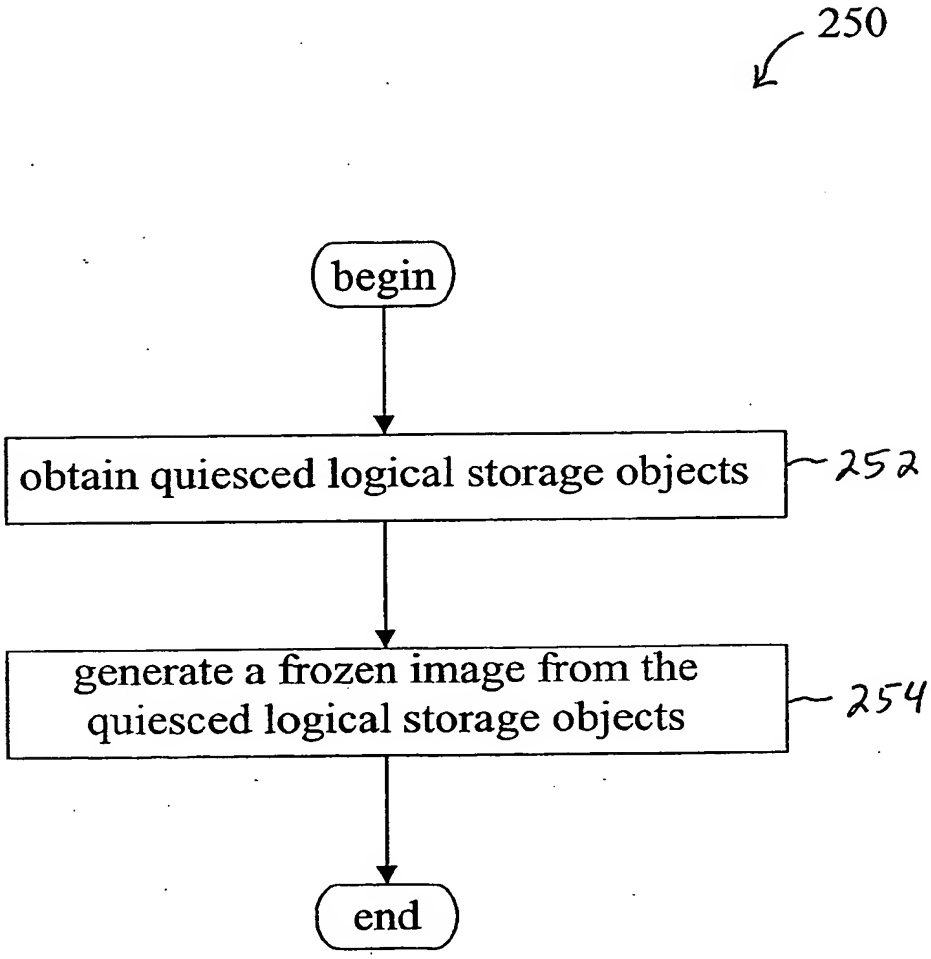

FIG. 6

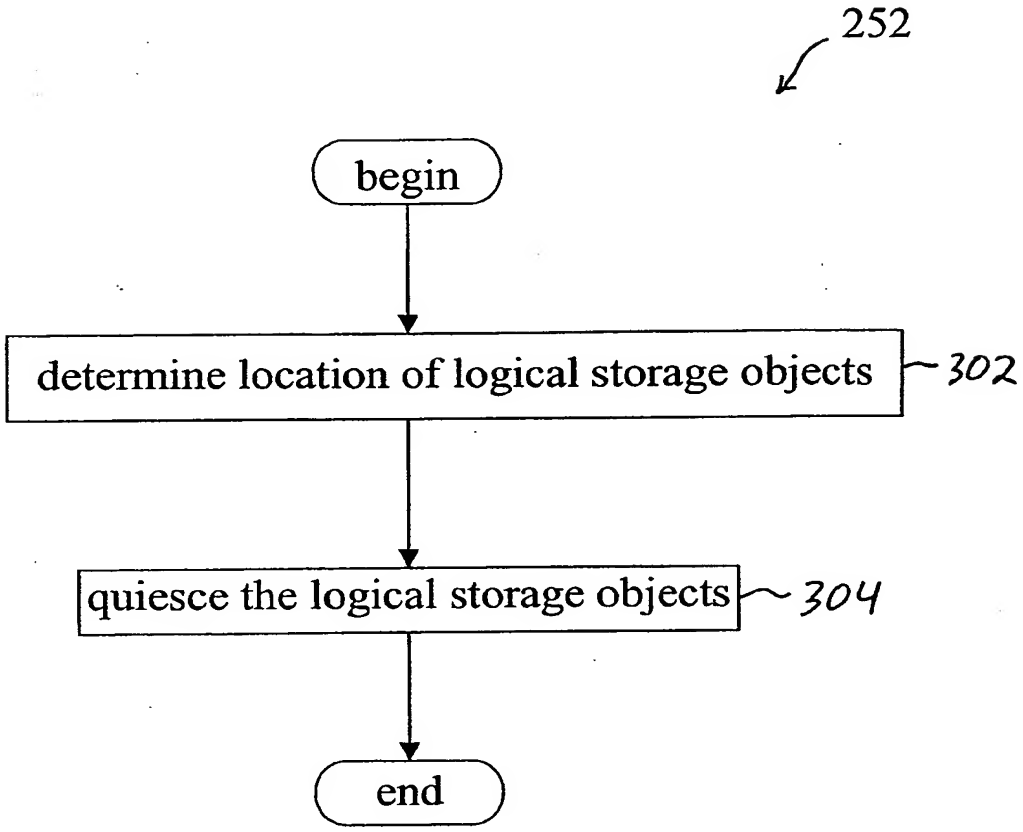
252
begin
determine location of logical storage objects
302
quiesce the logical storage objects
304
end

FIG. 7

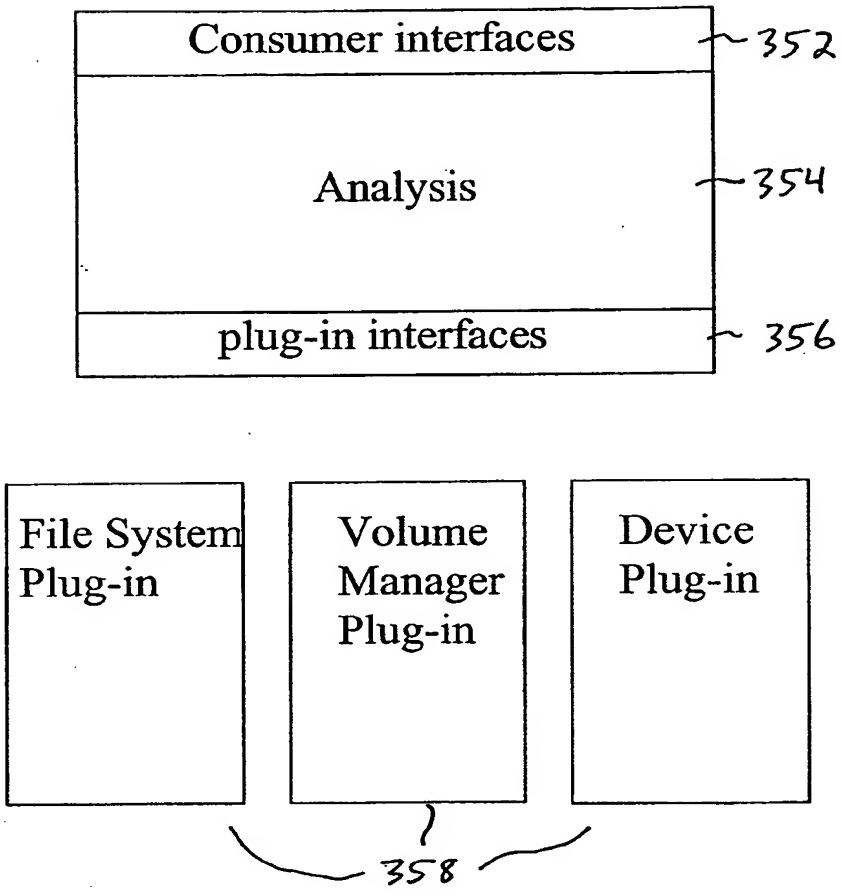
Consumer interfaces
352
Analysis
354
plug-in interfaces
356
File System Plug-in
Volume Manager Plug-in
Device Plug-in
358
350

FIG. 8

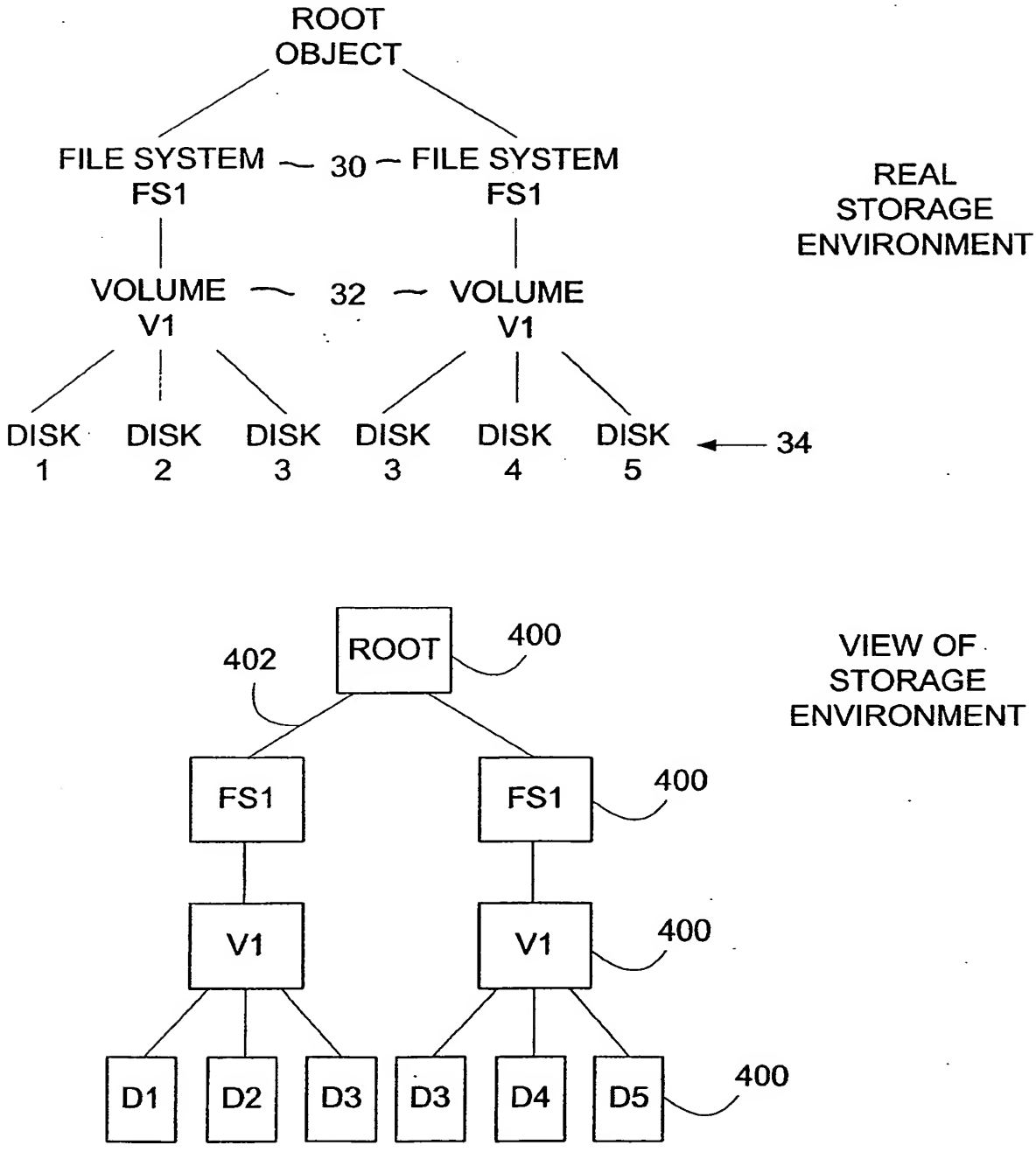
ROOT
OBJECT
FILE SYSTEM
FS1
30
FILE SYSTEM
FS1
REAL
STORAGE
ENVIRONMENT
VOLUME
V1
32
VOLUME
V1
DISK
1
DISK
2
DISK
3
DISK
3
DISK
4
DISK
5
34
ROOT
400
402
VIEW OF
STORAGE
ENVIRONMENT
FS1
FS1
400
V1
V1
400
D1
D2
D3
D3
D4
D5
400

FIG. 9

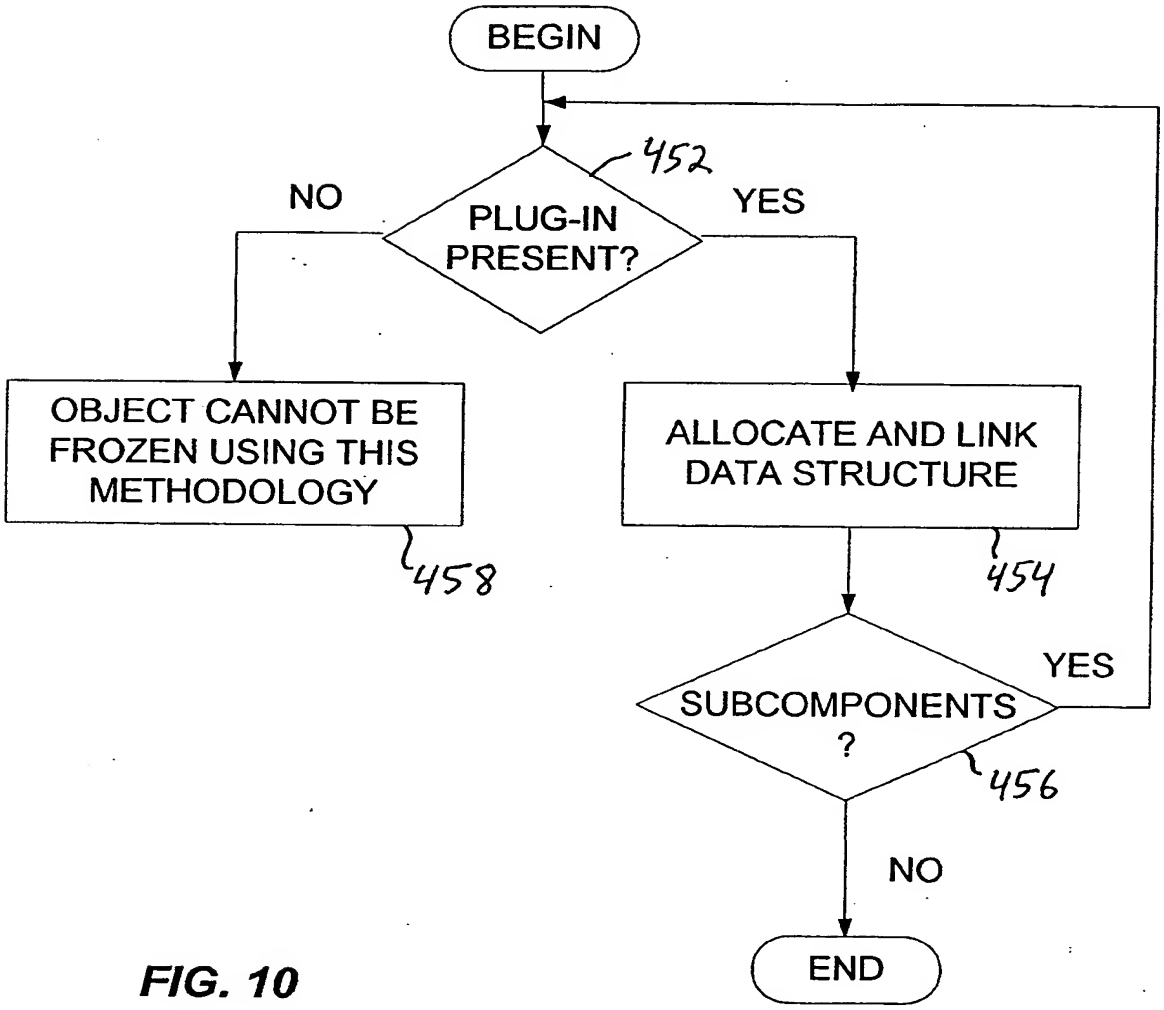
BEGIN
452
PLUG-IN PRESENT?
NO
YES
OBJECT CANNOT BE FROZEN USING THIS METHODOLOGY
458
ALLOCATE AND LINK DATA STRUCTURE
454
SUBCOMPONENTS ?
YES
456
NO
END

FIG. 10

470

4	atomic multi-file-system
3	serial file-system
2	atomic device level
1	serial device level
0	none

FIG. 11

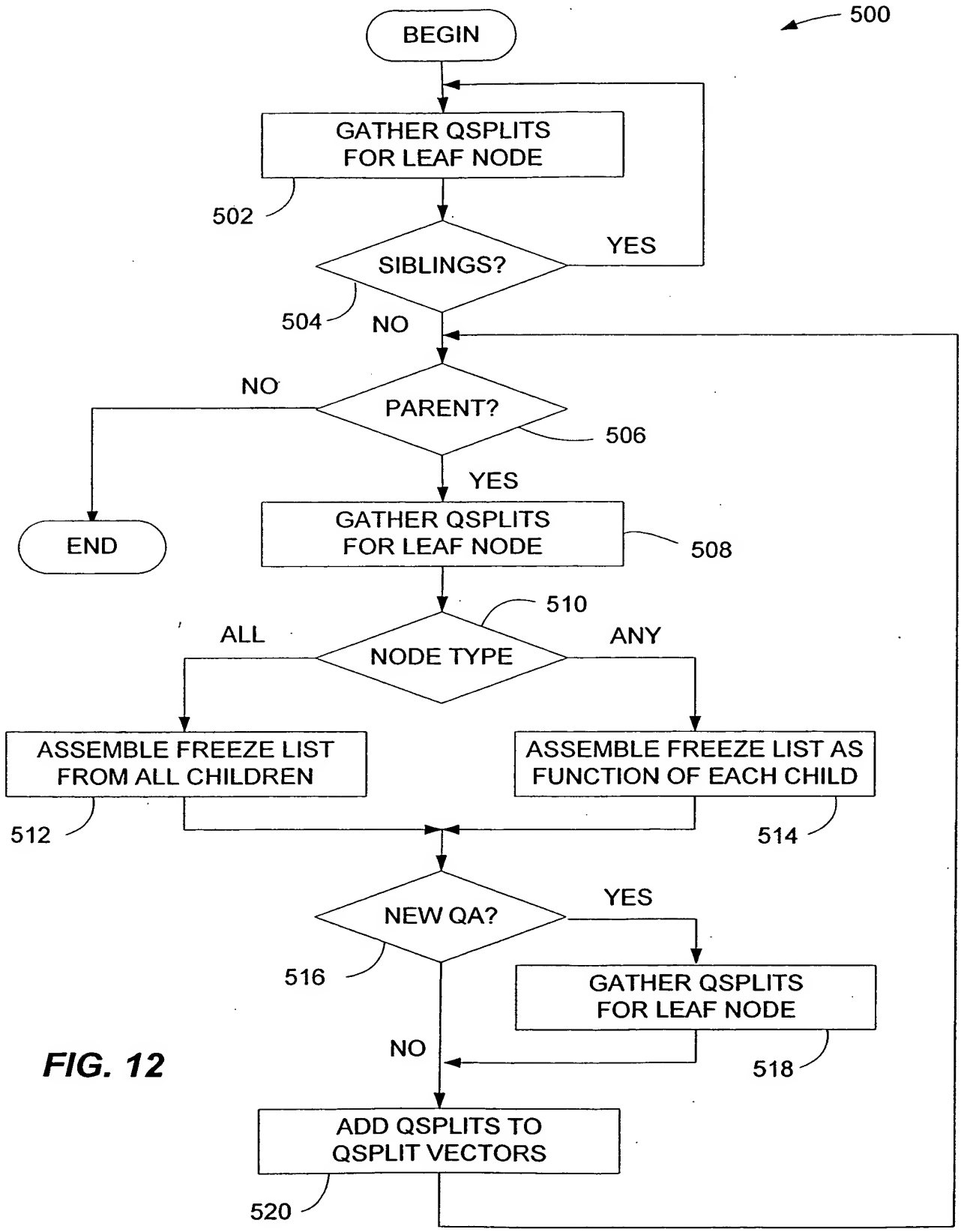
500
BEGIN
GATHER QSPLITS FOR LEAF NODE
502
SIBLINGS?
YES
504
NO
NO
PARENT?
506
YES
END
GATHER QSPLITS FOR LEAF NODE
508
510
ALL
NODE TYPE
ANY
ASSEMBLE FREEZE LIST FROM ALL CHILDREN
ASSEMBLE FREEZE LIST AS FUNCTION OF EACH CHILD
512
514
NEW QA?
YES
516
GATHER QSPLITS FOR LEAF NODE
NO
518
ADD QSPLITS TO QSPLIT VECTORS
520

FIG. 12

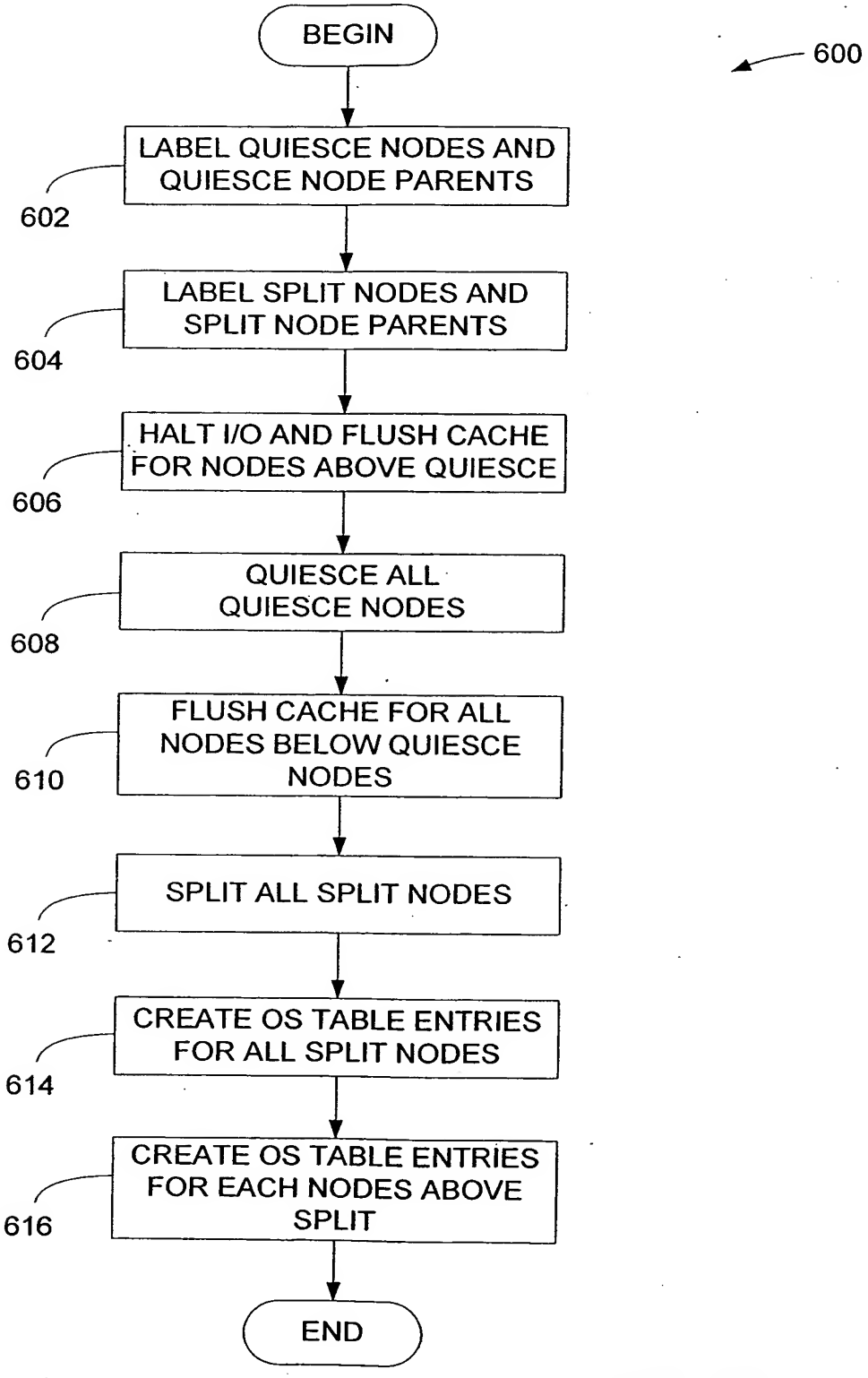

FIG. 13

20020210 "106780"

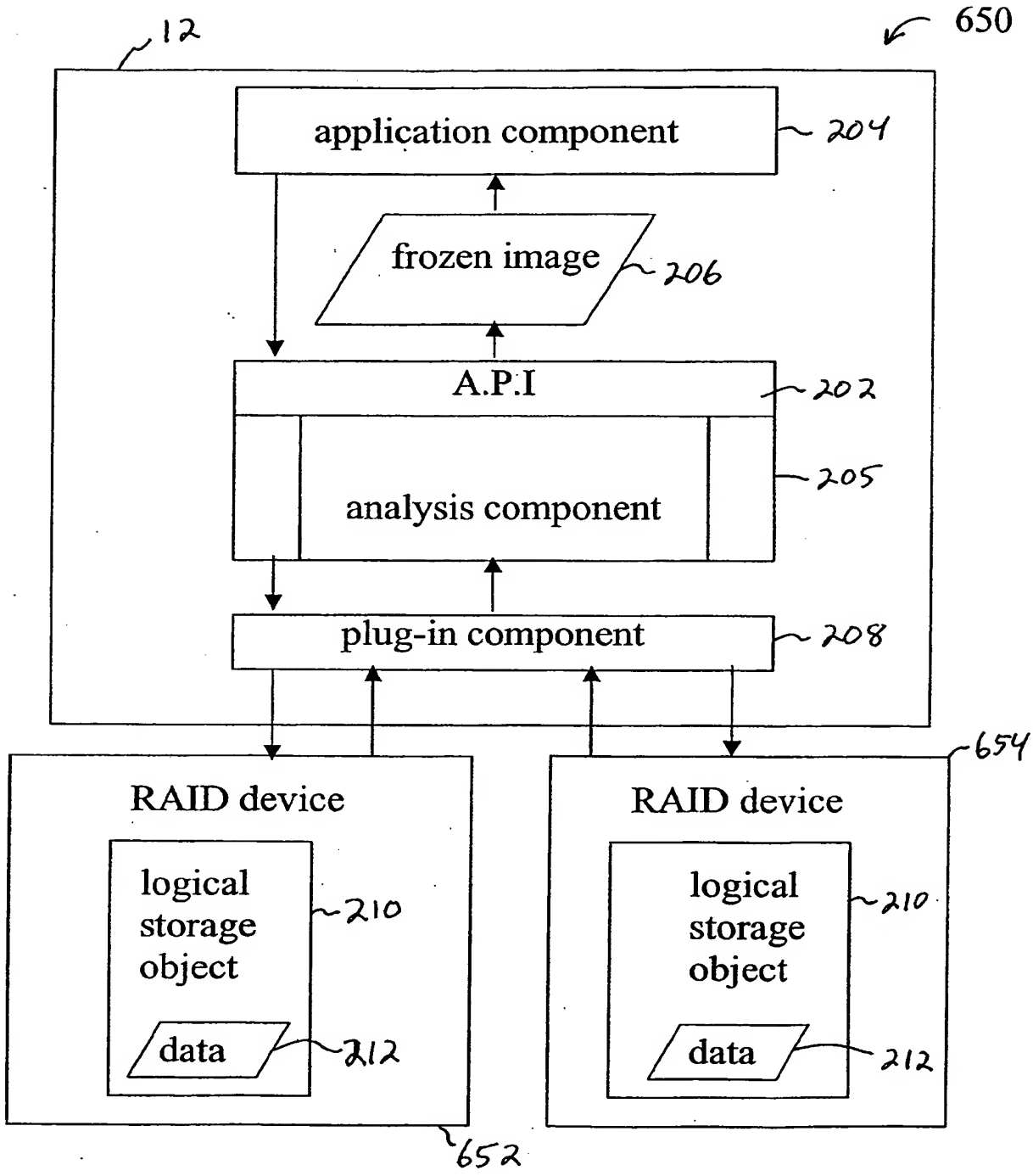
12
650
application component
204
frozen image
206
A.P.I
202
analysis component
205
plug-in component
208
654
RAID device
logical storage object
210
data
212
RAID device
logical storage object
210
data
212
652

FIG. 14